

REMARKS

I. Introduction

With the addition of claims 17 to 52, claims 1 to 7, 10 to 12, and 14 to 52 are currently pending in this application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Interview Summary

Applicant thanks the Examiner for the courtesies extended during the telephone interview of December 16, 2004.

During the course of the telephone interview no exhibit was shown and no demonstration was conducted.

During the course of the telephone interview claims 1 and 16 were discussed.

During the course of the telephone interview U.S. Patent No. 3,595,302 to Mallener, U.S. Patent No. 5,927,378 to Grove et al., and WO 97/43063 to Stagge et al. were discussed.

During the course of the telephone interview, Applicants suggested amending amend claim 1 so as to provide numbering for the three options laid out in the last clause of claim 1 as follows: "at least one of (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body." The Examiner agreed that such amendment would overcome the first of two grounds for the 35 U.S.C. §112, second paragraph, indefiniteness rejection of claims 1 to 7, 10 to 12, 14 and 15.

During the course of the telephone interview, the Examiner suggested adding the language "in diameter" after "being configured narrower" in claim 1, which Applicants agreed to. The Examiner indicated that this amendment would overcome the objection to the Specification and the second of two grounds for the 35 U.S.C. §112, second paragraph, rejection of claims 1 to 7, 10 to 12 and 14 to 16.

During the course of the telephone interview, Applicants further argued that original claim 12 and the original drawings provided support for the "running parallel to the pouring direction" limitation in claims 1 and 16. The Examiner agreed with Applicants and agreed to withdraw the 35 U.S.C. §112, first paragraph, rejection of claims 1 to 7, 10 to 12 and 14 to 16.

During the course of the telephone interview Applicants argued with respect to claims 1 and 16 that none of the cited references disclose cooling bore holes running parallel to the pouring direction and at least one of (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body. The Examiner agreed with Applicants' arguments and agreed to withdraw all of the 35 U.S.C. §102 based rejections provided the claims were amended as agreed upon to overcome the 35 U.S.C. §112 rejections.

The general results or outcome of the telephone interview is that the Examiner agreed to allow claims 1 to 7, 10 to 12, and 14 to 16 provided Applicants amend claim 1, as agreed, to overcome the 35 U.S.C. §112 rejection. The Examiner further agreed to allow three new independent claims, identical to claim 1 but each reciting only one of the following three options for the cooling bore holes: (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body. The Examiner further agreed to allow dependent claims for each of these new independent claims identical to claims 2 to 7, 10 to 12, 14, 15, except for their dependency on their respective new independent claim, etc.

III. Objection to the Specification

The Specification was objected to under 37 C.F.R. §1.75 (d)(1) as allegedly failing to provide proper antecedent basis for the claimed subject matter.

The Office Action asserts that although the term "narrower" is deemed to mean "reduction in width," it remains unclear with respect to what larger structural feature the bore holes become narrower. Applicants respectfully submit that claim 1, as amended, makes clear that the bore holes one of (i) run closer to the pouring surface, (ii) are configured narrower in diameter, and (iii) are spaced closer to each other in at least one portion of the die body. With regard to (ii), Applicants respectfully submit that the language "bore holes . . . are configured narrower . . . in at least one portion of the die body" makes reasonably clear that the bore holes in at least one other area or portion of the die body have a larger cross sectional area than in the "at least one portion of the die body." Notwithstanding the above, to expedite prosecution, claim 1 has been amended to recite "(ii) are configured narrower in diameter." (Emphasis added) The Examiner agreed during the telephone interview that this amendment would overcome the present objection to the Specification. Therefore, withdrawal of the objections to the Specification is respectfully requested.

IV. Rejection of Claims 1 to 7, 10 to 12 and 14 to 16
under 35 U.S.C. §112, 1st ¶

Claims 1 to 7, 10 to 12 and 14 to 16 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the Specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. With respect to claims 1 and 16, the Office Action alleges that the limitations “cooling bore holes running parallel to the pouring direction” contains new matter given the alleged lack of discussion in the application of the bore hole running parallel to the pouring direction.

As agreed to by the Examiner during the telephone interview, original claim 12 provides direct support for the recitation “cooling bore holes running parallel to the pouring direction.”

The Office Action seems to further allege that the application is not enabling given that there is “no clear evidence that the cooling bore holes actually run parallel to the pouring direction.” Applicants respectfully submit that the Office Action's present assertions and arguments do not reflect the proper standard for determining whether a patent application complies with the enablement requirement that the Specification describe how to make and use an invention that is defined by the claims. See M.P.E.P. § 2164 (even if a claim feature does “lack descriptive support in the disclosure,” this does not mean that the feature is not enabled; a claim feature “in and of itself may enable one skilled in the art to make and use the claim containing” the claim feature).

This standard may not be based on the subjective beliefs of an examiner, but must be based on reasonable arguments that are supported by proper evidence. The Supreme Court established the appropriate standard as requiring the establishment by proper evidence of whether any experimentation for practicing the invention was undue or unreasonable. See M.P.E.P. § 2164.01 (citing Mineral Separation v. Hyde, 242 U.S. 261, 270 (1916); In re Wands, 858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed Cir. 1988)). Thus, the enablement test is whether “one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art *without undue experimentation*.” See id. (citing United States v. Teletronics, Inc., 857 F.2d 778, 785, 8 U.S.P.Q.2d 1217, 1223 (Fed. Cir. 1988)).

The Federal Circuit has also stated that there are many factors to be considered in determining whether a specification satisfies the enablement requirement. These factors

include but are not limited to the following: the breadth of the claims; the nature of the invention; the state of the prior art; the level of ordinary skill; the level of predictability in the art; the amount of direction provided by the inventor; the existence of working examples; and the quantity of experimentation needed to make or use the invention based on the disclosure. See id. (citing In re Wands, 858 F.2d at 737, 8 U.S.P.Q.2d at 1404 and 1407)). The Federal Circuit has further stated that it is “*improper* to conclude that a disclosure is not enabling based on an analysis of only one of the above factors,” and that an examiner’s analysis must “consider all the evidence related to each of these factors” so that any nonenablement conclusion “must be based on the evidence as a whole.” See M.P.E.P. § 2164.01.

Moreover, to reject the claims as not being enabling, an examiner bears the initial burden of establishing exactly why the “scope of protection provided by a claim is not adequately enabled by the disclosure.” See id. (citing In re Wright, 999 F.2d 1557, 1562, 27 U.S.P.Q.2d 1510, 1513 (Fed. Cir. 1993)). Accordingly, a specification that teaches the manner and process of making and using an invention in terms that correspond in scope to those used in describing and defining the claimed subject matter complies with the enablement requirement. See id.

In particular, to properly establish enablement or non-enablement, the Office must make use of proper evidence, sound scientific reasoning and the established law. In the case of Ex Parte Reese, 40 U.S.P.Q.2d 1221 (Bd. Pat. App. & Int. 1996), a patent examiner rejected, under the first paragraph of 35 U.S.C. § 112, application claims because they were based on an assertedly non-enabling disclosure, and was promptly reversed because the rejection was based only on the examiner’s subjective belief that the specification was not enabling as to the claims. In particular, the examiner’s subjective belief was simply not supported by any “evidence or sound scientific reasoning” and therefore ignored recent case law — which makes plain that an examiner, and not an applicant, bears the burden of persuasion on an enablement rejection.

More particularly, the examiner in Ex parte Reese was reversed because the rejection had only been based on a conclusory statement that the specification did not contain a sufficiently explicit disclosure to enable a person to practice the claimed invention without exercising undue experimentation — which the Board found to be merely a conclusory statement that only reflected the subjective and unsupported beliefs of a particular examiner and that was not supported by any proper evidence, facts or scientific reasoning. See id. Moreover, the Board made clear that it is “incumbent upon the Patent Office . . . to back up assertions of its own with acceptable evidence,” and also made clear that “[where an]

examiner's 'Response to Argument' is not supported by evidence, facts or sound scientific reasoning, [then an] examiner has not established a *prima facie* case of lack of enablement under 35 U.S.C. § 112, first paragraph.” See *id.* at 1222 & 1223 (italics in original). Here, it has not even been conclusorily asserted that undue experimentation would be required.

It is believed and respectfully submitted that a person of reasonable skill in the art could without undue experimentation make and/or use the casting die as recited in the present claims. Further, as indicated above, the Examiner has indicated during the telephone interview that the present claims satisfy the requirements of 35 U.S.C. § 112. Therefore, withdrawal of the 35 U.S.C. § 112 rejection and allowance of these claims are respectfully requested.

V. Rejection of Claims 1 to 7, 10 to 12 and 14 to 16
under 35 U.S.C. §112, 2nd ¶

Claims 1 to 7, 10 to 12 and 14 to 16 were rejected under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Applicants respectfully submit that claims 1 to 7, 10 to 12 and 14 to 16 are allowable for the following reasons.

The second paragraph of 35 U.S.C. §112 merely requires that the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. As provided in M.P.E.P. § 2173.02, the “focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph is whether the claim meets the threshold requirement of clarity and precision.” In this regard, the “essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity.” *Id.* (emphasis added). “Definiteness of claim language must be analyzed, not in a vacuum, but in light of [, inter alia, the] content of the particular application disclosure [and the] claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.” *Id.* If the claims, when read in light of the Specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the second paragraph of 35 U.S.C. §112 demands no more. M.P.E.P. § 2173.05(a) (citing Shatterproof Glass Corp. v. Libbey Owens Ford Co., 758 F.2d 613, 225 U.S.P.Q. 634 (Fed. Cir. 1985)).

With regard to claim 1, the Office Action alleges that it is unclear what is meant by the limitation “at least one of running closer to the pouring surface, being

configured narrower, and being spaced closer in at least one portion of the die body.”

Applicants respectfully submit that claim 1 reasonably clearly conveys to one skilled in the art that the bore holes, consistent with the Examiners second asserted interpretation, at least one of (i) runs closer to the pouring surface, (ii) is configured narrower, and/or (iii) are spaced closer, in at least one portion of the die body. Claim 1 has been amended to include a numbering scheme, consistent with the Examiner's second interpretation.

The Office Action further alleges that it is unclear what is meant by the limitation “being configured narrower.” As agreed upon during the phone interview, Applicants have amended claim 1 to add the language "in diameter" after "being configured narrower."

The Office Action further alleges that the recitation “funnel” in claim 14 lacks antecedent basis. Applicants respectfully submit that claim 14 has been amended to include antecedent basis for “funnel.” Support for this amendment can be found in original claim 3 and in the Specification, for example, at p. 5, lines 27 to 28.

In view of all of the foregoing, withdrawal of the rejection under 35 U.S.C. §112 and allowance of claims 1 to 7, 10 to 12 and 14 to 16 are respectfully requested.

VI. Rejection of Claims 1, 10, 12 and 15 Under 35 U.S.C. §102(b)

Claims 1, 10, 12 and 15 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 3,595,302 (“Mallener”). Applicants respectfully submit that claims 1, 10, 12 and 15 are not rendered unpatentable by Mallener for the following reasons.

Claim 1 relates to a liquid-cooled casting die for continuous billet casting. Claim 1 recites that the casting die includes a form-giving casting die body having at least one broad side wall with a pouring-surface for receiving molten metal in a pouring direction, a cooling-surface in contact with a cooling bath, the pouring-surface and the cooling-surface defining a thickness. Claim 1, as amended, further recites that the cooling bore holes run parallel to the pouring direction and at least one of (i) run closer to the pouring surface, (ii) are configured narrower in diameter, and (iii) are spaced closer to each other in at least one portion of the die body. Support for this amendment can be found in the Specification, for example, at p. 5, lines 1 to 13

Mallener purportedly relates to a cooling structure for continuous-casting mold. The mold is stated to include mold plates having grooves 16 cut into the rear surface. See col. 2, lines 60 to 73. Nowhere, however, does Mallener disclose, or even suggest,

cooling bore holes running parallel to the pouring direction and at least one of (i) running closer to the pouring surface, (ii) being configured narrower, and (iii) being spaced closer to each other in at least one portion of the die body, as recited in amended claim 1. Therefore, Mallener does not disclose all of the limitations of claim 1.

The Office Action alleges that the grooves 16 qualify as the cooling bore holes. As the Examiner agreed to during the telephone interview, the Specification makes a clear distinction between cooling grooves or channels and bore holes. The term groove or channel is used when referring to the channel illustrated in Figures 4 and 5. The bore holes refer to holes drilled in the casting die between the channels, which is consistent with Figure 3 and original claim 15. Original claim 15 recites that the cooling bore holes are arranged between the coolant channels. Consistent with the above, when the Specification refers to features common to both the coolant grooves or channels and the bore holes it states "the same applies to the cooling bore holes." See p. 5, line 21. Clearly, therefore, if the language "cooling channels" means the same thing as "cooling bore holes" (which it does not), as the Office Action seems to allege, then (i) there would be no need to point out in the Specification that specific discussion relating to one also applies to the other and (ii) the recitation that the bore holes are arranged between the channels would be senseless.

Further, Applicants respectfully submit that the Office Action's allegation that a cooling bore qualifies as a coolant channel is inconsistent with how the term "cooling bore" hole is used by those of ordinary skill in the art. For example, U.S. Patent No. 6,145,579 ("Stagge et al."), which claims priority to WO 97/43063, cited by the Examiner in the present Office Action, makes clear that to one of ordinary skill in the art a cooling bore hole is different than a cooling channel, and therefore, that the cooling channel of Mallener does not qualify as the recited cooling bore hole. Stagge et al. relate to a liquid-cooled mold. The mold, as shown in Figures 1 and 3, is stated to include cooling bore holes 11, which run in vertical cross-sectional planes QE, and separate groove-like coolant channels 10, which run parallel to the casting direction QR. See col. 2, lines 27 to 35 and col. 3, lines 36 to 55. Therefore, the grooves 16 of Mallener do not qualify as a cooling bore hole, as recited in claim 1.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the

prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). As more fully set forth above, it is respectfully submitted that Mallener does not disclose, or even suggest, cooling bore holes running parallel to the pouring direction and at least one of (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body, as recited in amended claim 1. Therefore, as agreed to by the Examiner during the telephone interview, Mallener does not anticipate claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(b) rejection and allowance of claim 1 is respectfully requested.

As for claims 10, 12 and 15, which ultimately depend from claim 1, and therefore include all the limitations of claim 1, it is respectfully submitted that Mallener does not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(b) rejection and allowance of claims 10, 12 and 15 are respectfully requested.

VII. Rejection of Claims 1 to 7, 10 to 12 and 14 to 16 Under 35 U.S.C. §102(e)

Claims 1 to 7, 10 to 12 and 14 to 16 were rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 5,927,378 ("Grove et al."). Applicants respectfully submit that claims 1 to 7, 10 to 12 and 14 to 16 are not rendered unpatentable by Grove et al. for the following reasons.

Grove et al. purportedly relate to a continuous casting mold and method. The casting mold is stated to include die plates including cooling slots 36 defined in the mold liner assembly 30 for conducting heat away from the inner surface 32 of the mold liner assembly 30. See col. 3, lines 29 to 31. T_m is stated to be the thickness at the deepened slot portion 40 and T_b is stated to be the thickness at the deepened slot portion 38. See col. 3, lines 55 to 56. The distance $T_b - T_m$ is stated to be varied along the horizontal extent of the mold so as to selectively direct enhanced cooling to certain portions of the inner surface of the mold liner assembly, and, to direct a diminished cooling effect to other portions of the mold liner assembly. See col. 3, line 66 to col. 4, line 4. Nowhere, however, do Grove et al. disclose, or even suggest, cooling bore holes running parallel to the pouring direction and at least one of (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body, as recited in amended claim 1.

For the same reasons detailed above with respect to grooves of Mallener, and as agreed to by the Examiner during the telephone interview, Applicants respectfully submit that the cooling slots 36 of Grove et al. do not qualify as bore holes. Therefore, Grove et al. do not anticipate claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(e) rejection and allowance of claim 1 are respectfully requested.

As for claims 2 to 7, 10 to 12 and 14 to 16, which ultimately depend from claim 1, and therefore include all the limitations of claim 1, it is respectfully submitted that Grove et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(e) rejection and allowance of claims 2 to 7, 10 to 12 and 14 to 16 are respectfully requested.

VIII. Rejection of Claims 1 to 5, 10, 12 and 15 Under 35 U.S.C. §102(a)

Claims 1 to 5, 10, 12 and 15 were rejected under 35 U.S.C. §102(a) as anticipated by WO 97/43063 ("Stagge et al."). Applicants respectfully submit that claims 1 to 5, 10, 12 and 15 are not rendered unpatentable by Stagge et al. for the following reasons.

Stagge et al. purportedly relate to a liquid-cooled mold. Stagge et al. state that the mold includes side walls 2 including groove-like coolant channels 10, which can be supplied with cool water. See Abstract and p. 6, third paragraph of the translation provided by the Examiner. Nowhere, however, do Stagge et al. disclose, or even suggest, cooling bore holes running parallel to the pouring direction and at least one of (i) running closer to the pouring surface, (ii) being configured narrower in diameter, and (iii) being spaced closer to each other in at least one portion of the die body, as recited in amended claim 1.

For the same reasons detailed above with respect to grooves of Mallener, and as agreed to by the Examiner during the telephone interview, Applicants respectfully submit that the cooling channels 10 of Stagge et al. do not qualify as bore holes. Therefore, Stagge et al. do not anticipate claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(a) rejection and allowance of claim 1 are respectfully requested.

As for claims 2 to 5, 10, 12 and 15, which ultimately depend from claim 1, and therefore include all the limitations of claim 1, it is respectfully submitted that Stagge et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 1. Accordingly, withdrawal of the 35 U.S.C. §102(a) rejection and allowance of claims 2 to 5, 10, 12 and 15 are respectfully requested.

IX. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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